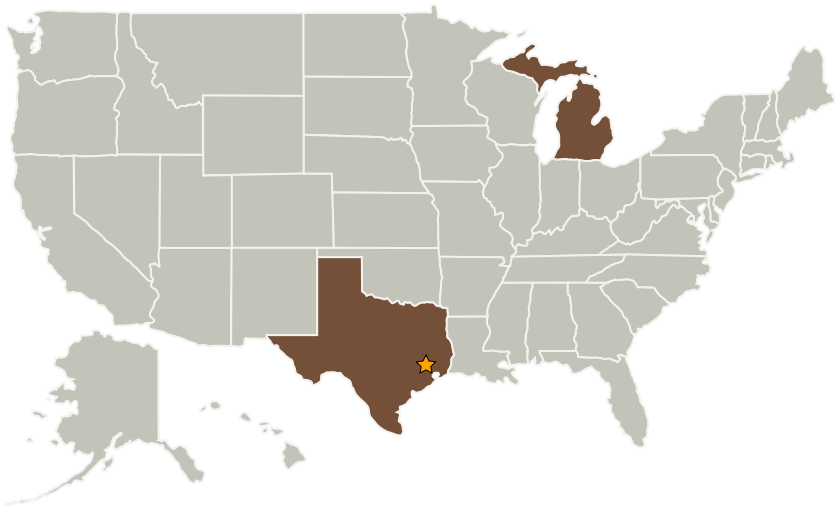
Composite advanced polymers for low moisture and oxygen permeability, Phase I

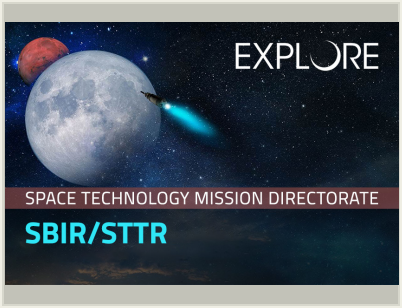
Completed Technology Project (2004 - 2004)

Project Introduction

This Small Business Innovation Research Phase I program addresses NASA?s need for long duration shelf stable food by developing a high oxygen/moisture barrier polymer system with good optical quality and extended durability for food packaging. At the present time, processable polymers with good optical quality have only intermediate barrier properties, e.g., Nylon-6 and Polyester. Several groups have successfully reduced their moisture and oxygen transmission rates to 30% of their initial values by adding surface treated clays and/or oxygen scavengers, but the transmission rates are still too high. In this program, T/J Technologies will dramatically improve the barrier properties of transparent polymers by tailoring the processing and microstructure of nanocomposite systems. Specifically, we propose to achieve lower transmission rates using a combination of a high barrier polymer, a range of selected additives that can be oriented to reduce gas and vapor permeation, and solution based processing to improve additive dispersion and the ability to orient the additive. We anticipate the resulting materials will show >50% enhancement in oxygen and moisture barrier properties when compared to existing barrier polymer systems.

Primary U.S. Work Locations and Key Partners





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Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Center / Facility:

Johnson Space Center (JSC)

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

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Organizations Performing Work	Role	Type	Location
★Johnson Space Center(JSC)	Lead Organization	NASA Center	Houston, Texas
T/J Technologies, Inc.	Supporting Organization	Industry	Ann Arbor, Michigan

Primary U.S. Work Locations	
Michigan	Texas

Project Management

Program Director:

Jason L Kessler

Program Manager:

Carlos Torrez

Principal Investigator:

John R Miller

Technology Areas

Primary:

- TX12 Materials, Structures, Mechanical Systems, and Manufacturing
  - TX12.1 Materials
    - TX12.1.5 Coatings